



# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

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May 3, 2001

TO: ~~Internal Files~~

THRU: Pamela Grubaugh-Littig, Permit Supervisor, Team Lead *pgl*  
Daron Haddock, Permit Supervisor *QZ*

FROM: Peter Hess, Reclamation Specialist III, Team Lead *PHH*  
Wayne Western, Senior Reclamation Engineer *WW*  
Mike Suflita, Senior Reclamation Hydrologist *MS*

RE: Response #3 to Division Order DO00A, West Ridge Resources, Inc., West Ridge Mine, C/007/041-DO00A-3

## SUMMARY:

Due to a concern relative to the reclaim ability of the recently constructed high wall at the West Ridge Mine, the UDNR/OGM issued West Ridge Resources, Inc. Division order DO00A requiring the permittee to submit "as-built" designs for the surface facilities area. These were to include information relative to "as-built" maps of the site, a slope stability analysis and a detailed reclamation plan for the highwall area, and "as constructed" designs for the hydrologic requirements of the site.

On July 14, 2000, the UDNR/OGM received a response to Division Order DO00A-1, which dealt with as-built drawings and slope stability analyses for the West Ridge Mine. Additional material relative to the hydrology regime of the mining and reclamation plan was received in a follow up submittal on September 18, 2000. The Division completed a deficiency review of all information received up to that point on November 30, 2000.

The permittee responded to the November 30, 2000 deficiency document on March 16, 2001. Based on a preliminary review by myself and Messrs. Wayne Western and Mike Suflita, there are concerns relative to the hydrologic review as well as the slope stability of the reclaimed highwall area which had been specifically identified in the Division's November 30, 2000 deficiency document.

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**TECHNICAL ANALYSIS:**

**OPERATION PLAN**

**MINING OPERATIONS AND FACILITIES**

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

**Analysis:**

**General**

The permittee failed to revise the C2 form to indicate that the disturbed area size is changed. The amount of disturbance that was created by the construction of the Mine is actually less than what was originally permitted. There are at least two MRP text references that reflect the "permitted" disturbed area acreage rather than the "as-built" disturbed area acreages. The incorrect acreages must be corrected to reflect the requirements within regulations R645-301-510, -301-511, and -301-511.100.

**Findings:**

The text of the mining and reclamation plan has not been revised to accurately reflect the correct amount of disturbed area acreage.

**RECLAMATION PLAN**

**STABILIZATION OF SURFACE AREAS**

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

**Analysis:**

When the original PAP was approved, the proposed design of the highwall area and its associated reclamation design were capable of meeting the requirements of R645-300-133.700 and -300-133.710. With the extensive coal burn encountered during construction the permittee found it necessary to construct a highwall that was more extensive than originally anticipated. Thus, it is necessary for the permittee to submit a new reclamation design that is capable of meeting the aforementioned R645 coal rules.

The permittee gave the Division a slope stability analysis for the highwall area with the July 14, 2000 submittal. This analysis made assumptions that were felt to be unrealistic and without adequate justification as to why the assumptions could be made. The Division noted these in the November 30, 2000 deficiency document. The permittee's March 16, 2001 response

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states, "some of the information requested by the Division was not yet included in the slope stability report and that information would be submitted when available." The missing information that was requested on November 30, 2000, but not received with the March 16, 2001 response includes the following:

- a) **R645-301-553.130.** The angles of repose for the material that is to be used for the backfill as well as the topsoil material that is to be used were not given. Page 2 of the Agapito Associates slope stability analysis states that the source of the backfill material has not yet been identified by the permittee, therefore, it is impossible at this time to determine the physical properties of the backfill material. An engineering analysis cannot be made which would either determine or disprove that a long-term static safety factor of the reclaimed highwall area is achievable. R645-301-553.130 requires that reclaimed slopes do not exceed the angle of repose. The proposed reclamation slopes are as steep as 40 degrees. The angle of repose for most soils is from 35-45 degrees.

**R645-301-542.200.** The permittee must develop the specifications for the physical properties of the materials used to reclaim the highwall areas and where those materials will be obtained. The plan must also include quality controls to ensure that the materials meet the minimum specifications. The Division is specifically concerned about the physical properties of soil placed along the out slopes and top of the slopes since those areas cannot be compacted.

If the proposed slope angle for the reclamation back fill area exceeds the angle of repose for the fill material, then the permittee must modify the reclamation plan.

- b) **R645-301-553.130.** The Division is concerned about the long-term slope stability of the reclaimed cut slopes/highwalls. On Figure 1 of the slope stability analysis, the height of the disturbed slope is 74 ft. On Map 5-6B, the cut slope/highwall on Station 24 + 00 has a height of 105 feet. Since slopes become less stable as height increases, the permittee's slope stability analysis must calculate the safety factor for the worst case, highest slope.
- c) **R645-301-553.130.** The permittee must provide supporting information about why the reclaimed slopes will not become saturated. The Division is concerned that during the snowmelt or a heavy rainfall the upper few feet of soil could become saturated. If the soils can become saturated, then the permittee must calculate the slope stability analysis using saturated conditions. Page 3 of the slope stability analysis performed by Agapito Associates Inc. states that "All slope stability analysis were conducted considering a dry slope that will not be affected by groundwater or surface water, per discussion with Andalex personnel." No justification was given as to how Andalex personnel could make such a bold, unrealistic assumption. The permittee did not include designs or discussion relative as to how the implemented highwall reclamation plan

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would re-route undisturbed flows from the reclaimed highwall area or otherwise prevent or greatly reduce saturation of the topsoil and/or backfill material. The Division must require that all soil saturation conditions be evaluated in order to ensure that a minimum long-term static safety factor of 1.3 can be maintained.

- d) **R645-301-542.200.** The slope stability analysis was based on a conceptual plan that raises several questions about how the actual backfilling, grading and vegetation will be accomplished. Therefore, the Division will need the permittee to submit additional information about the highwall elimination plan. Concerns that were raised in the slope stability analysis are as follows:
- The slope stability analysis was done with the assumption that the materials would have a minimum of 90% of the standard Proctor amount (page 3 of the slope stability report). That standard is needed to achieve the shear strength needed for slope stability. On page 4 of the slope stability analysis AGAPITO ASSOCIATES, INC. states that mechanical compaction of the soil may be needed to achieve the needed shear strength. Mechanical compaction of the upper 3' to 4' is not possible due to it deleterious effect on root development. Therefore, the permittee must show that the material placed on the back-filled slope will have the physical properties needed to achieve stability and meet the required minimum long-term static safety factor.
  - Some parts of the slopes can be constructed by placing the soil in lifts. However, some parts of the slopes such as the upper areas cannot be placed in lifts. Therefore, the permittee must show that the material that is placed on the upper slopes will have the physical properties needed to ensure its stability in order to achieve the minimum safety factor.
  - Cross section Station 21+00 on Map 5-6A shows that the highest bench that could be used for placing construction equipment is at elevation 7045 ft. The upper reach of the slope is at elevation 7070 ft. The permittee needs to show how the soil will be placed in the upper slope area. This information is needed to show that the reclamation plan is feasible and for the calculation of reclamation costs for the high wall area.

**Findings:**

The permittee has failed to address many of the major concerns that were aired in the Division's November 30, 2000 deficiency document. No additional information has been received to date from the permittee that would support information received as of March 16, 2001. The stability analysis does not have sufficient information to make a determination as to the reclaim ability of the highwall area, or its ability to meet the requirement of R645-301-

553.130. The submittal does not meet the requirements of **R645-300-133.700** or **R645-301-553.130**.

### CONCLUSIONS:

The permittee constructed a high wall at the West Ridge portal area that was much higher and more extensive than approved within the permit application package, due to encountering unforeseen geologic conditions during construction. The Division requested that the permittee submit "as-built" drawings and stability analysis to show that the reclaimed high wall would be able to meet the required long-term static safety factor of 1.3, or provide a revised reclamation plan to ensure that requirement.

The permittee's March 16, 2001 response to the Division's second deficiency review has failed to provide critical information that was specifically requested relative to the reclaim ability of the high wall area. The permittee has merely indicated that certain missing information will be provided as it becomes available. To date, (May 3, 2001) no additional information has been received relative to the stability analysis of the highwall. The permittee has not committed to when that same missing information might be provided, nor have they committed to any specific method to be followed in order obtain that information. Thus, a potential compliance situation exists. **R645-300-133.700 and -133-710** requires that the applicant "demonstrate that reclamation as required by the State Program can be accomplished according to information given in the permit application." The permittee has not done this.

### RECOMMENDATIONS:

The permittee's March 16, 2001 deficiency response should be returned, based on the fact that it failed to address critical concerns that were specifically pointed out relative to the stability of the reclamation plan for the portal high wall area. Interdisciplinary reviews of the March 16, 2001 submittal should stop until the permittee is able to submit a complete and adequate submittal.

Since a Division order, DO00A, has been issued to the permittee, and the permittee has been given what is felt by the Division as an adequate time frame in which to respond, but has failed to do so, the Division should consider additional action.